

DATE FILED: July 12, 2002

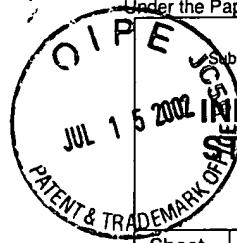
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U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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**INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

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Sheet

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of

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**Complete If Known**

Application Number	09/498,303
Filing Date	February 4, 2000
First Named Inventor	Han
Group Art Unit	1763
Examiner Name	T. Dang
Attorney Docket Number	MIT7941

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	U.S. Patent Document		Name of Patentee or Applicant Of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code <sup>2</sup> (if known)			
TD	A1	4,127,437		Bersin et al.	11-28-1978	
	B1	4,605,479		Faith, Jr.	08-12-1986	
	C1	4,806,171		Whitlock et al.	02-21-1989	
	D1	4,900,395		Syverson et al.	02-13-1990	
	E1	4,904,338		Kozicki	02-27-1990	
	F1	4,932,168		Tada et al.	06-12-1990	
	G1	5,025,597		Tada et al.	06-25-1991	
	H1	5,062,898		McDermott et al.	11-05-1991	
	I1	5,073,232		Ohmi et al.	12-17-1991	
	J1	5,078,832		Tanaka	01-07-1992	
	K1	5,089,084		Chhabra et al.	02-18-1992	
	L1	5,089,441		Moslehi	02-18-1992	
	M1	5,100,495		Ohmi et al.	03-31-1992	
	N1	5,112,437		Watanabe et al.	05-12-1992	
	O1	5,129,198		Kanno et al.	07-14-1992	
	P1	5,147,466		Ohmori et al.	09-15-1992	
	Q1	5,167,761		Westendorp et al.	12-01-1992	
	R1	5,173,152		Tanaka	12-22-1992	
	S1	5,174,855		Tanaka	12-29-1992	
	T1	5,209,028		McDermott et al.	05-11-1993	
	U1	5,238,500		Bergman	08-24-1993	

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FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document		Name of Patentee or Applicant Of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Office <sup>3</sup>	Number <sup>4</sup>			
TD	V1	WO	94 27315	IMEC Inter Uni Micro Electro.; Adv. Semiconductor Mat.	11-24-1994	
	W1	EP	0 732 733	Nippon Electric; ASM Japan	09-18-1996	
	X1	EP	0 602 633	Texas Instruments	06-22-1994	
	Y1	EP	0 288 263	BOC Group Inc.	10-26-1988	
	Z1	WO	92 22084	Advantage Prod Tech	12-10-1992	
	AA1	JP	08 316189	Hitachi Ltd	11-29-1996	x(Abst).

Examiner Signature	<i>T. Dang</i>	Date Considered	10/21/02
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<sup>1</sup>Unique citation designation number. <sup>2</sup>See attached Kinds of U.S. Patent Documents. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>6</sup>Applicant is to place a check mark here if English language Translation is attached.

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		Number	Kind Code <sup>3</sup> (if known)			
TJ	A2	5,244,535		Ohtsuka et al.	09-14-1993	
	B2	5,268,069		Chapple-Sokol et al.	12-07-1993	
	C2	5,294,261		McDermott et al.	03-15-1994	
	D2	5,294,568		McNeilly et al.	03-15-1994	
	E2	5,315,793		Peterson et al.	05-31-1994	
	F2	5,336,356		Ban et al.	08-09-1994	
	G2	5,348,619		Bohannon et al.	09-20-1994	
	H2	5,357,991		Bergman et al.	10-25-1994	
	I2	5,372,652		Srikrishnan et al.	12-13-1994	
	J2	5,377,911		Bauer et al.	01-03-1995	
	K2	5,378,312		Gifford et al.	01-03-1995	
	L2	5,403,434		Moslehi	04-04-1995	
	M2	5,425,845		Wong	06-20-1995	
	N2	5,439,553		Grant et al.	08-08-1995	
	O2	5,456,758		Menon	10-10-1995	
	P2	5,512,106		Tamai et al.	04-30-1996	
	Q2	5,567,332		Mehta	10-22-1996	
	R2	5,580,421		Hiatt et al.	12-03-1996	
	S2	5,584,963		Takahashi	12-17-1996	
	T2	5,589,422		Bhat	12-31-1996	
	U2	5,635,102		Mehta	06-03-1997	

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# GROUP 1700

## **FOREIGN PATENT DOCUMENTS**

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*Mr. Day*

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## U.S. PATENT DOCUMENTS

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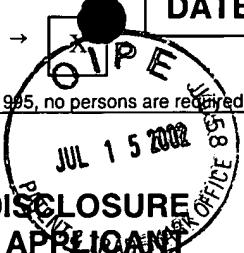
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STATEMENT BY APPLICANT

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Sheet	4	of	5	Attorney Docket Number	MIT7941
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## OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Included name of the author (in CAPITAL LETTERS). Title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T <sup>2</sup>
TD	A4	PETERSON et al., "Contamination Removal by CO <sub>2</sub> Jet Spray," SPIE Vol. 1329, <i>Optical System Contamination: Effects, Measurement, Control II</i> , pp. 72-85, 1990.	
	B4	LAYDEN et al., "High velocity carbon dioxide snow for cleaning vacuum system surfaces," <i>J. Vac. Sci. Technol. A</i> , Vol. 8, No. 5, pp. 3881-3883, Sep/Oct 1990.	
	C4	IZUMI et al., "A New Cleaning Method by Using Anhydrous HF/CH <sub>3</sub> OH Vapor System," <i>Japanese Journal of Applied Physics</i> , Int. Conf. On Solid State Devices and Materials, pp. 135-137, August 1991.	
	D4	WONG et al., "Characterization of Wafer Cleaning and Oxide Etching Using Vapor-Phase Hydrogen Fluoride," <i>J. Electrochem. Soc.</i> , Vol. 138, No. 6, pp. 1799-1802, June 1991.	
	E4	SYVERSON et al., "The Removal of Reactive Ion Etch Residues," Technical Report WC/DC/WS/R, TR 386, FSI International, Chaska, MN, May 10, 1993.	
	F4	SYVERSON et al., "Post Metal Etch Residue Removal Using Vapor Phase Processing Tech.," Technical Report WC/DC/WS/R, TR 392, FSI International, Chaska, MN, May 24, 1993.	
	G4	GAY et al., "Vapor Phase cleaning of Submicron Inter-Metal Vias," Technical Report DC/DE, TR 397, FSI International, Chaska, MN, November, 1993.	
	H4	BOHANNON et al., "Polysilicon Emitter Vapor Clean Characterization on an EXCALIBUR MVP," Technical Report DCSE, TR 393, FSI International, Chaska, MN, November 10, 1993.	
	I4	BOHANNON et al., "Titanium Salicide Vapor Clean Development on an EXCALIBUR MVP," Technical Report DCSE, TR 394, FSI International, Chaska, MN, November 10, 1993.	
	J4	WERKHOVEN et al., "Cluster-Tool Integrated HF Vapor Etching For Native Oxide Free Processing," <i>Mat. Res. Soc. Symp. Proc.</i> , Vol. 315, pp. 211-217, 1993.	
	K4	WATANABE et al., "Influence of Water Adsorption/Desorption Processes on the Selectivity of Vapor HF Etching," <i>J. Electrochem. Soc.</i> , Vol. 142, No. 4, pp. 1332-1340, April 1995.	
	L4	TONG et al., "The Removal of Polymeric/Silicate Residues and Reduction of Contact Resistance for Inter-metal Via Holes by Vapor Phase HF Cleaning," Surface Conditioning Systems Technical Report, Document No. 1024-TRS-1196, FSI International, Chaska, MN, October 1996.	
	M4	ALLGAIR et al., "Nanoscale patterning of silicon dioxide thin films by catalyzed HF vapor etching," <i>Nanotechnology</i> , Vol. 7, pp. 351-355, 1996.	
✓	N4	LEE et al., "Dry Release for Surface Micromachining with HF Vapor-Phase Etching," <i>Journal of Microelectromechanical Systems</i> , Vol. 6, No. 3, pp. 226-232, September 1997.	

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GROUP 1700

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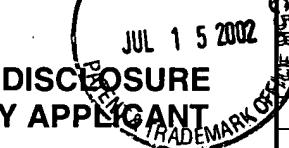
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Sheet 5 of 5

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS		
Examiner Initials*	Cite No. <sup>1</sup>	Included name of the author (in CAPITAL LETTERS). Title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published
AH	A5	SAITO et al., "X-ray Photoelectron Study on the Adsorption of Anhydrous Hydrogen Fluoride onto Silicon Native Oxide," <i>Jpn. J. Appl. Phys.</i> , Vol. 36, Part 2, No. 11A, pp. L1466-L1469, November 1997.
	B5	HABUKA et al., "In situ cleaning method for silicon surface using hydrogen fluoride gas and hydrogen chloride gas in a hydrogen ambient," <i>Journal of Crystal Growth</i> , Vol. 186, pp. 104-112, 1998.
	C5	NAKAZAWA et al., "Selective Etching of Silicon Native Oxide with Remote-Plasma-Excited Anhydrous Hydrogen Fluoride," <i>Jpn. J. Appl. Phys.</i> , Vol. 37, Part 2, No. 5A, pp. L537-538, May 1998.
	D5	CHANG et al., "Anhydrous HF etch reduces processing steps for DRAM capacitors," <i>Solid State Technology</i> , pp. 71-76, May 1998.
	E5	SHERMAN et al., "The removal of hydrocarbons and silicone grease stains from silicon wafers," <i>J. Vac. Sci. Technol. B</i> , Vol. 8, No. 3, pp. 563-567, May/June 1990.
	F5	PHILIPPOSSIAN, "The Activity of HF/H <sub>2</sub> O Treated Silicon Surfaces in Ambient Air Before and After Gate Oxidation," <i>Proc., Second Int. Symp. On Cleaning Technology in Semiconductor Device Manufacturing</i> , pp. 234-250, Oct. 1992.
	G5	NAKANISHI et al., "Precise Control of SiO <sub>2</sub> Etching Characteristics Using Mono-Layer Adsorption of Hf/H <sub>2</sub> O Vapor," <i>Int. Conf. On Solid State Devices &amp; Materials</i> , Extended Abstracts, C-1-4, pp. 255-257, August 1995.
	H5	PATENT ABSTRACTS OF JAPAN, Vol. 1997, No. 03, & JP 08316189A, Hitachi Ltd., March 1997.
	I5	HAN et al., "Characterization of Silicon Oxide Etching and Cleaning in HF Vapor Process," <i>Meeting Abstracts, Fifth Int. Symp. On Cleaning Technology in Semiconductor Device Manufacturing</i> , ECS, Paris, France, August 1997.
	J5	HAN et al., "Characterization of Silicon Oxide Etching and Cleaning in HF Vapor Process," <i>Proceedings, Cleaning Technology in Semiconductor Device Manufacturing V</i> , Novak et al., Editors, February 27, 1998.
	K5	HAN et al., "Etching and Cleaning of Silicon Wafers using HF Vapor Process in the Non-condensed Etching Regime," Abstract, <i>American Vacuum Society National Meeting</i> , Baltimore, MD, November 1998.
	L5	HAN et al., "Characterization of Silicon Oxide Etching in HF Vapor Process," Abstract, <i>American Vacuum Society National Meeting</i> , San Jose, CA, November 1997.
	M5	HAN, "HF Vapor Etching and Cleaning of Silicon Wafer Surfaces," Ph.D. Thesis, Massachusetts Institute of Technology, Cambridge, MA, July 1999.
	N5	KWON, "Post Oxide Etching Cleaning Process Using Integrated Ashing and HF Vapor Process," Masters Thesis, Massachusetts Institute of Technology, Cambridge, MA, May 1999.

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Examiner Signature		Date Considered	10/2/02
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